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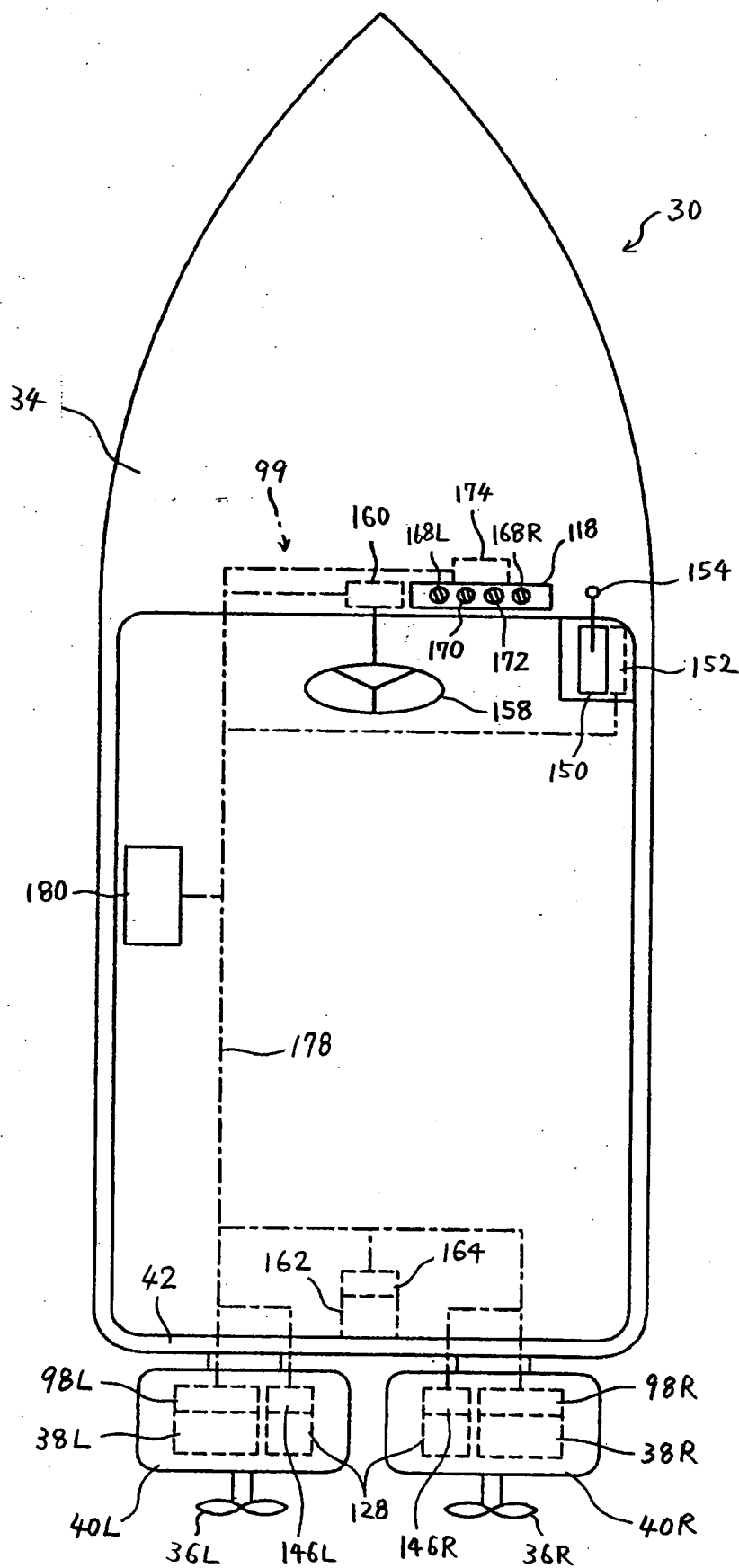


FIGURE 1

# ENGINE STARTING SYSTEM FOR MULTIPLE ENGINES

Takashi Okuyama

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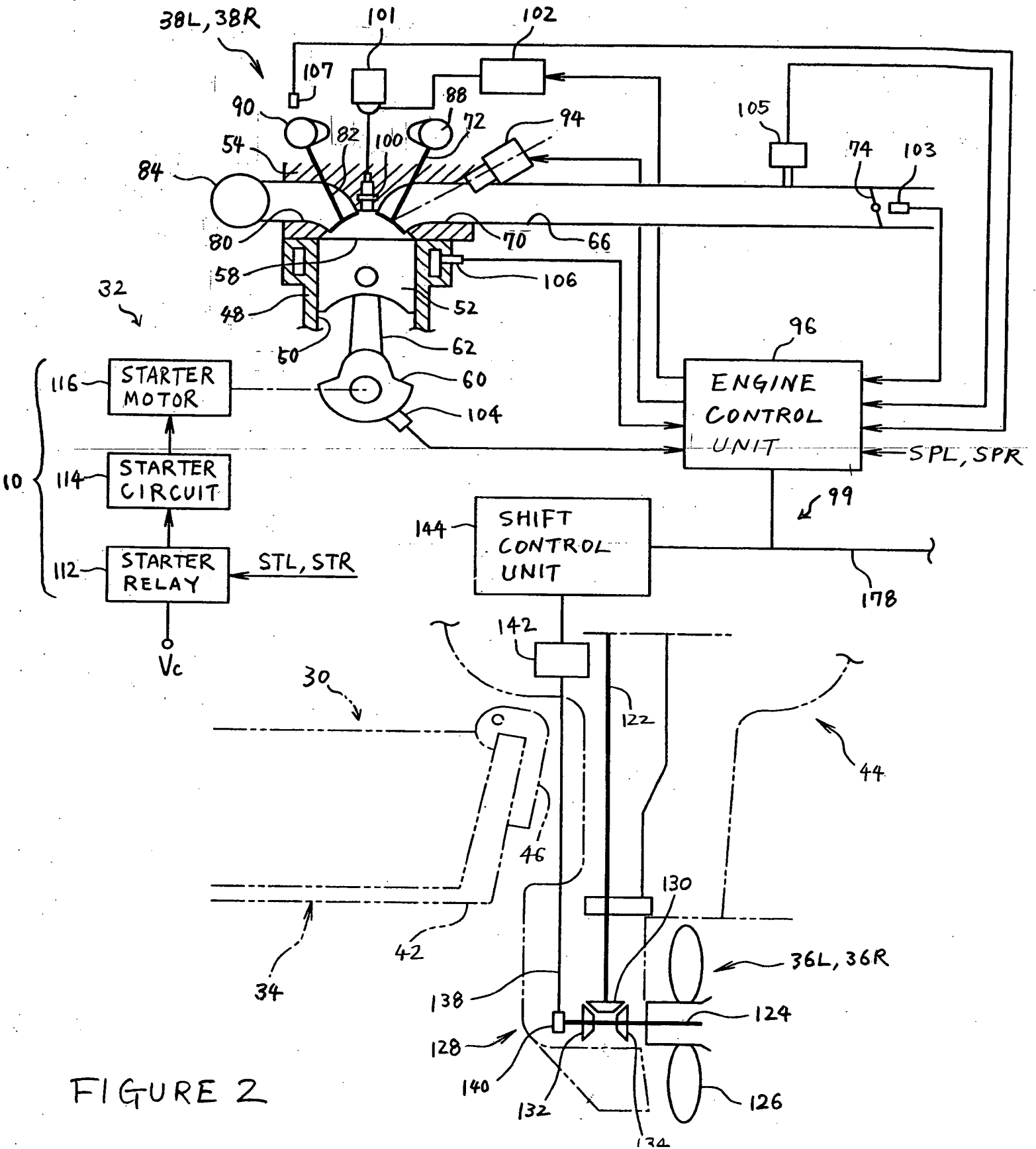


FIGURE 2

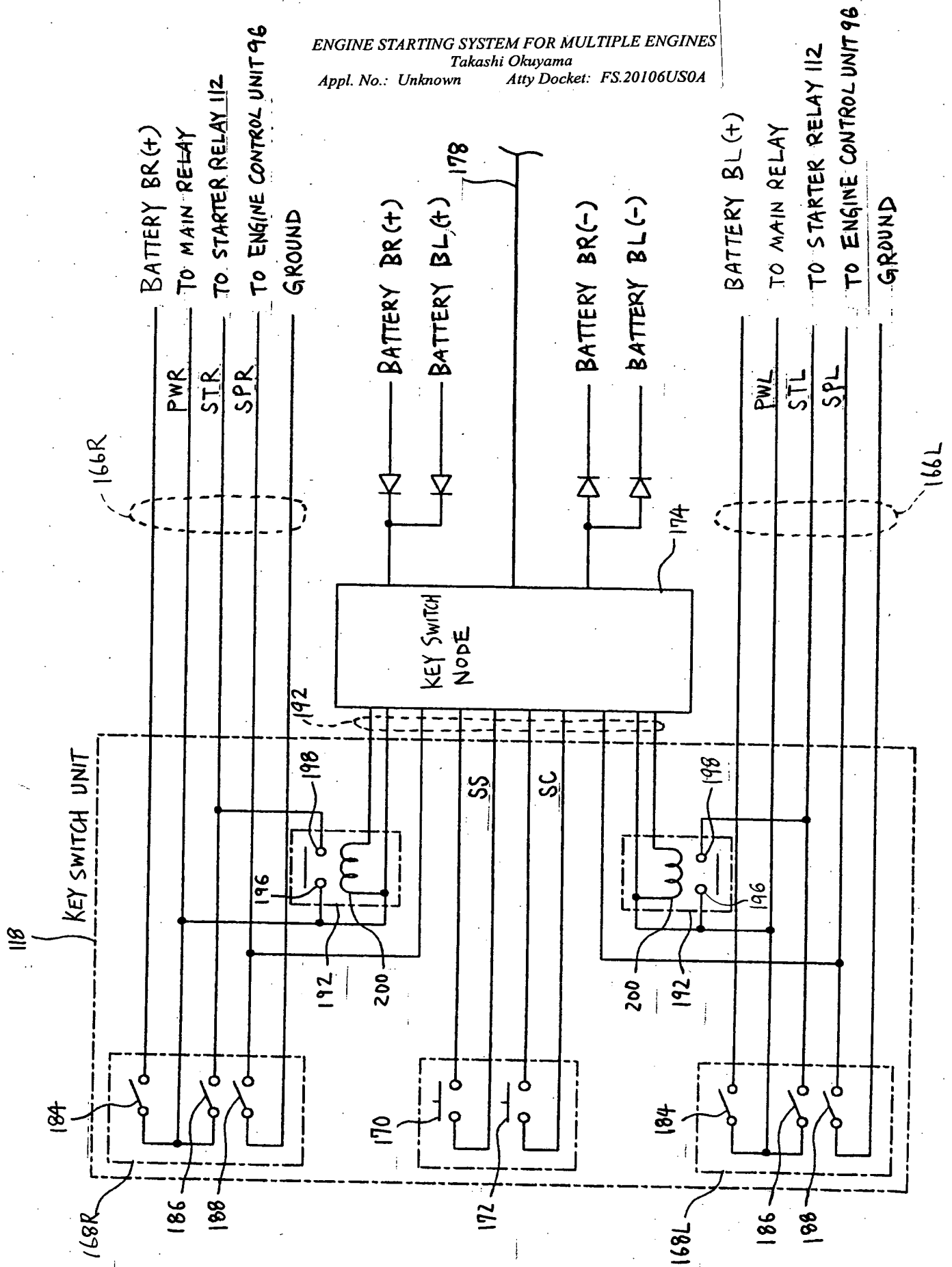


FIGURE 3

ENGINE STARTING SYSTEM FOR MULTIPLE ENGINES

Takashi Okuyama

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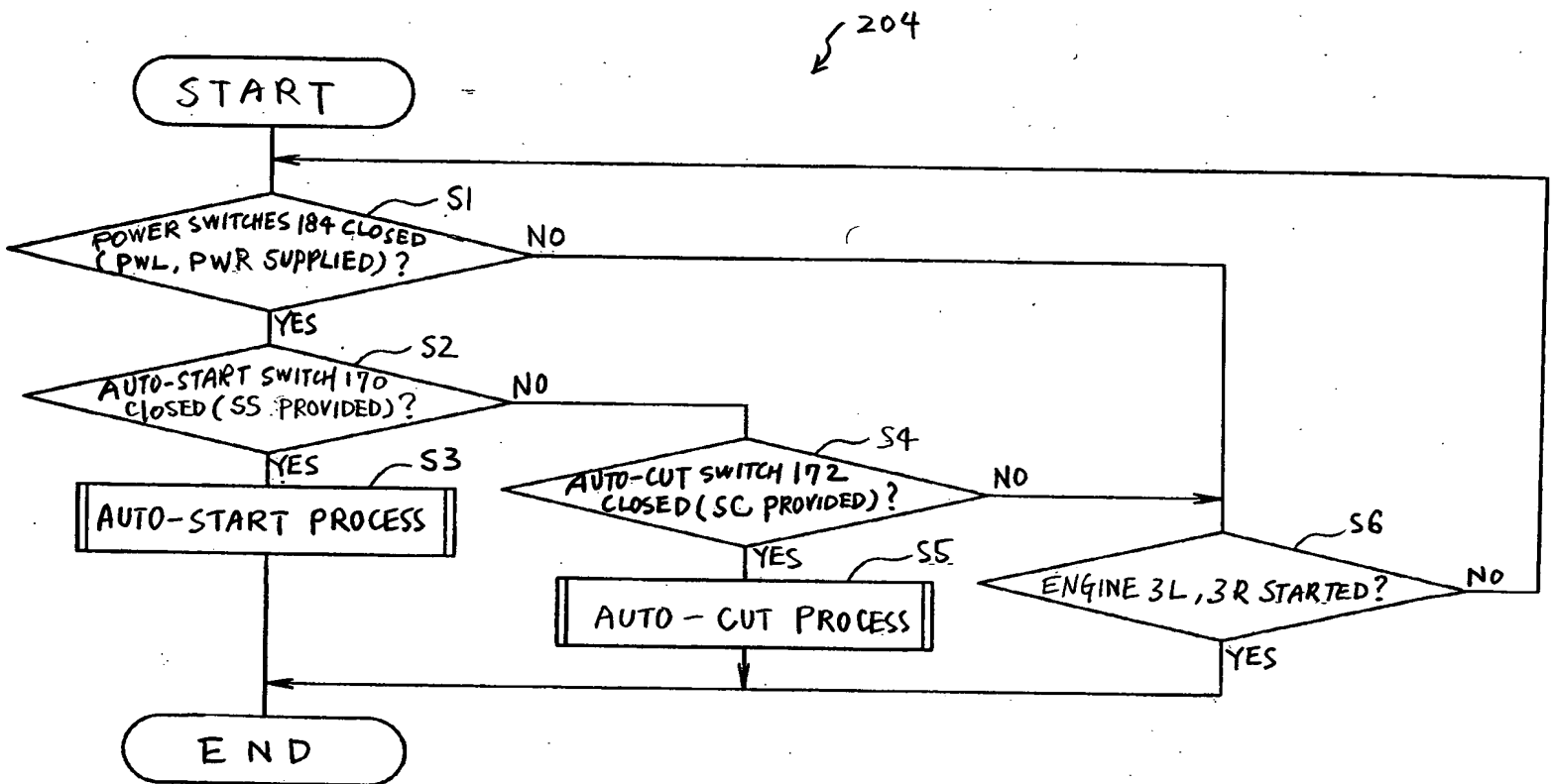


FIGURE 4

# ENGINE STARTING SYSTEM FOR MULTIPLE ENGINES

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START

STARTER RELAYS 112 ACTIVATED  
TIMER STARTS COUNTING TIME TL S11

206

READ  
ENGINE SPEED NL, NR S12

FL = "1"? S13

YES

NO

NL  $\geq$  Nth?

NO

YES

KEEP STARTER RELAY 112  
OF ENGINE 38L ACTIVATED S15

TD ELAPSED?

NO

YES

CONTROL STARTER RELAY 112  
OF ENGINE 38L DEACTIVATED S17

FL = "1" S18

FR = "1"? S19

NO

NR  $\geq$  Nth?

NO

YES

KEEP STARTER RELAY 112  
OF ENGINE 38R ACTIVATED S21

TD ELAPSED?

YES

CONTROL STARTER RELAY 112  
OF ENGINE 38R DEACTIVATED S23

FR = "1" S24

FL = "1" AND FR = "1"? S25

YES

NO

TL  $\geq$  Th?

YES

FL = "1"? S26

NO

YES

CONTROL STARTER RELAY 112  
OF ENGINE 38R DEACTIVATED S28

SHOW GUIDANCE AS TO START  
FAILURE OF ENGINE 38R S29

FR = "1"? S30

YES

CONTROL STARTER RELAY 112  
OF ENGINE 38L DEACTIVATED S31

SHOW GUIDANCE AS TO START  
FAILURE OF ENGINE 38L S32

CONTROL STARTER RELAYS  
OF BOTH ENGINES DEACTIVATED S33

SHOW GUIDANCE AS TO START  
FAILURE OF BOTH ENGINES S34

END

FIGURE 5

# ENGINE STARTING SYSTEM FOR MULTIPLE ENGINES

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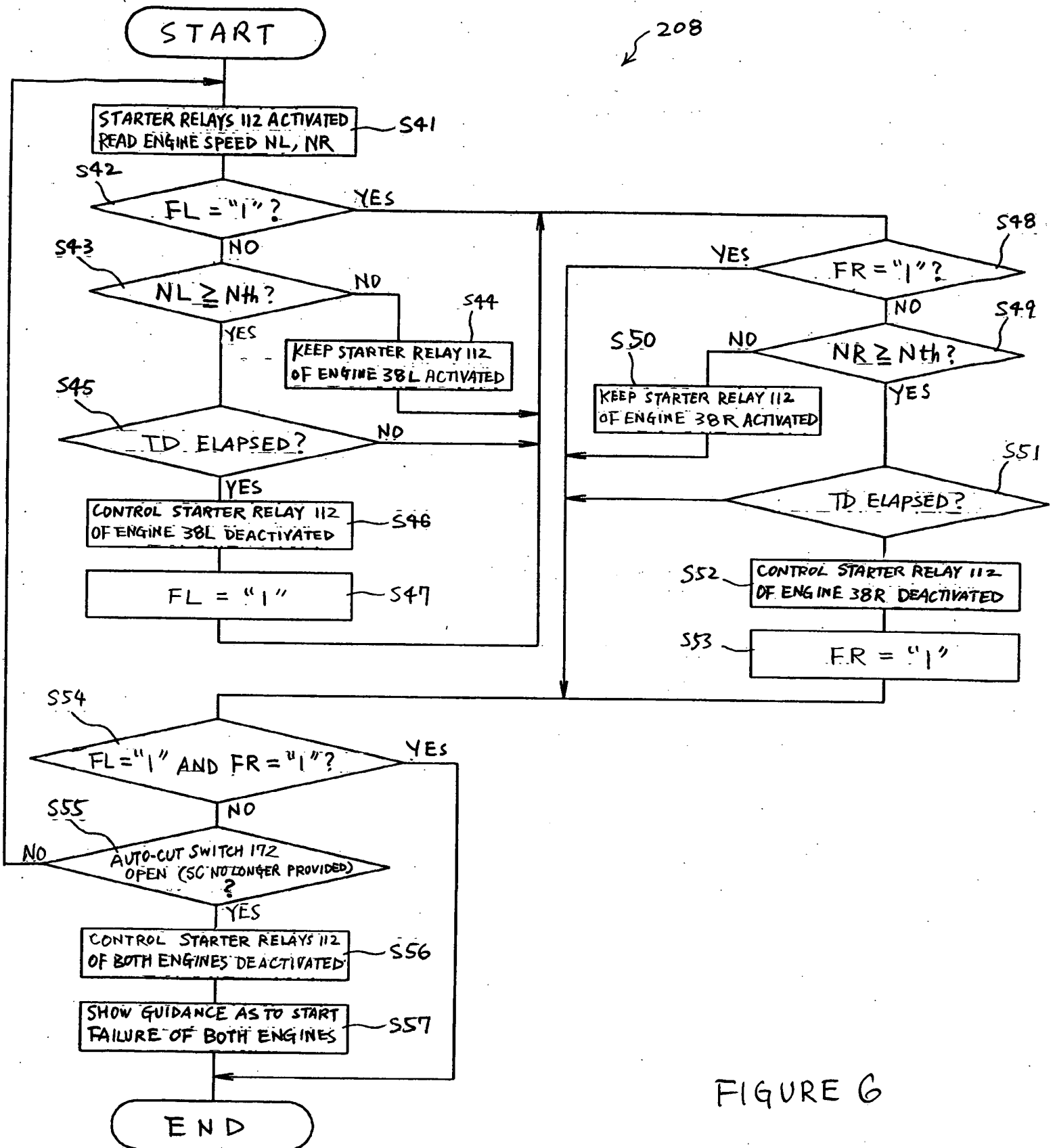


FIGURE 6

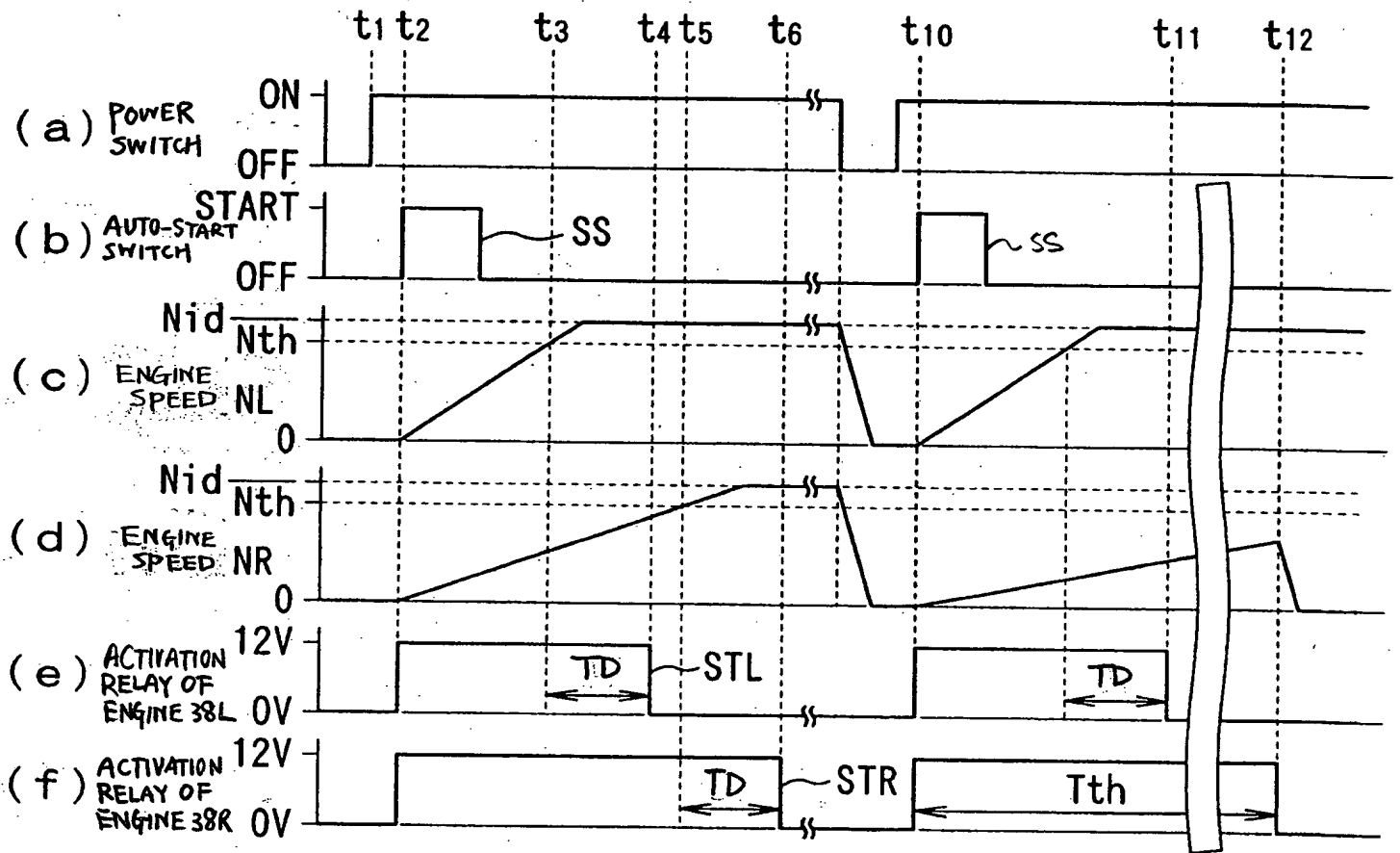


FIGURE 7



# ENGINE STARTING SYSTEM FOR MULTIPLE ENGINES

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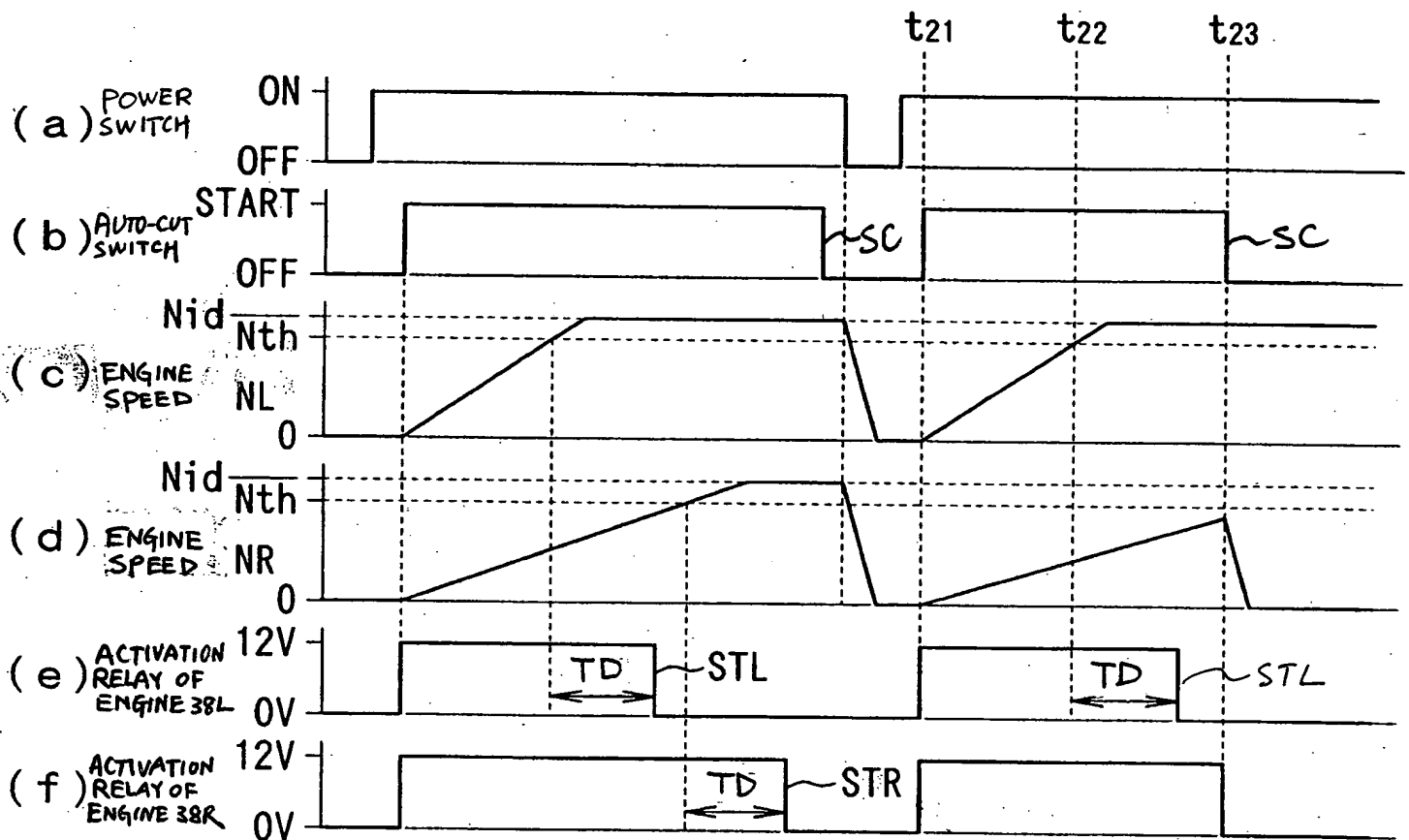


FIGURE 8

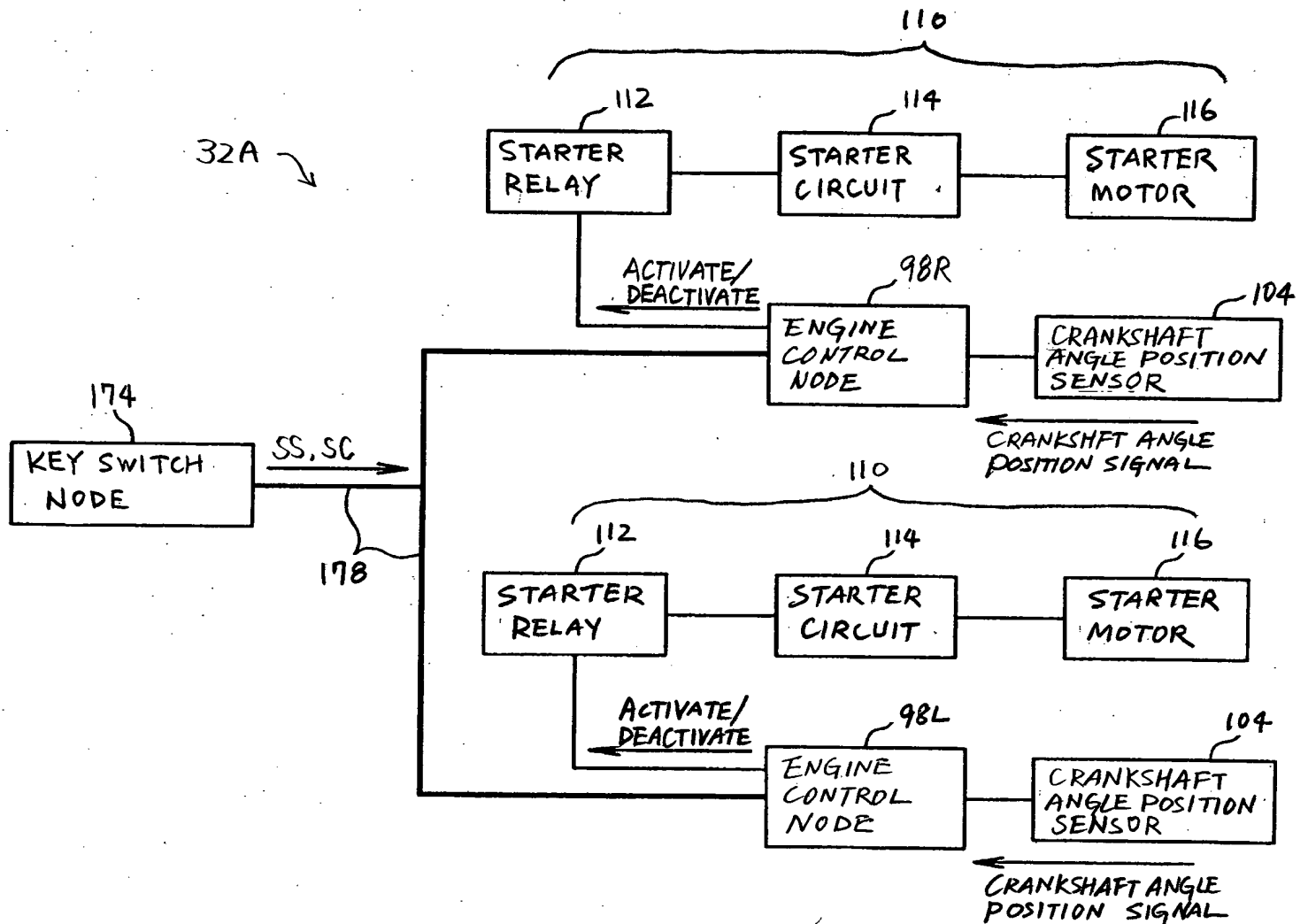


FIGURE 9

# ENGINE STARTING SYSTEM FOR MULTIPLE ENGINES

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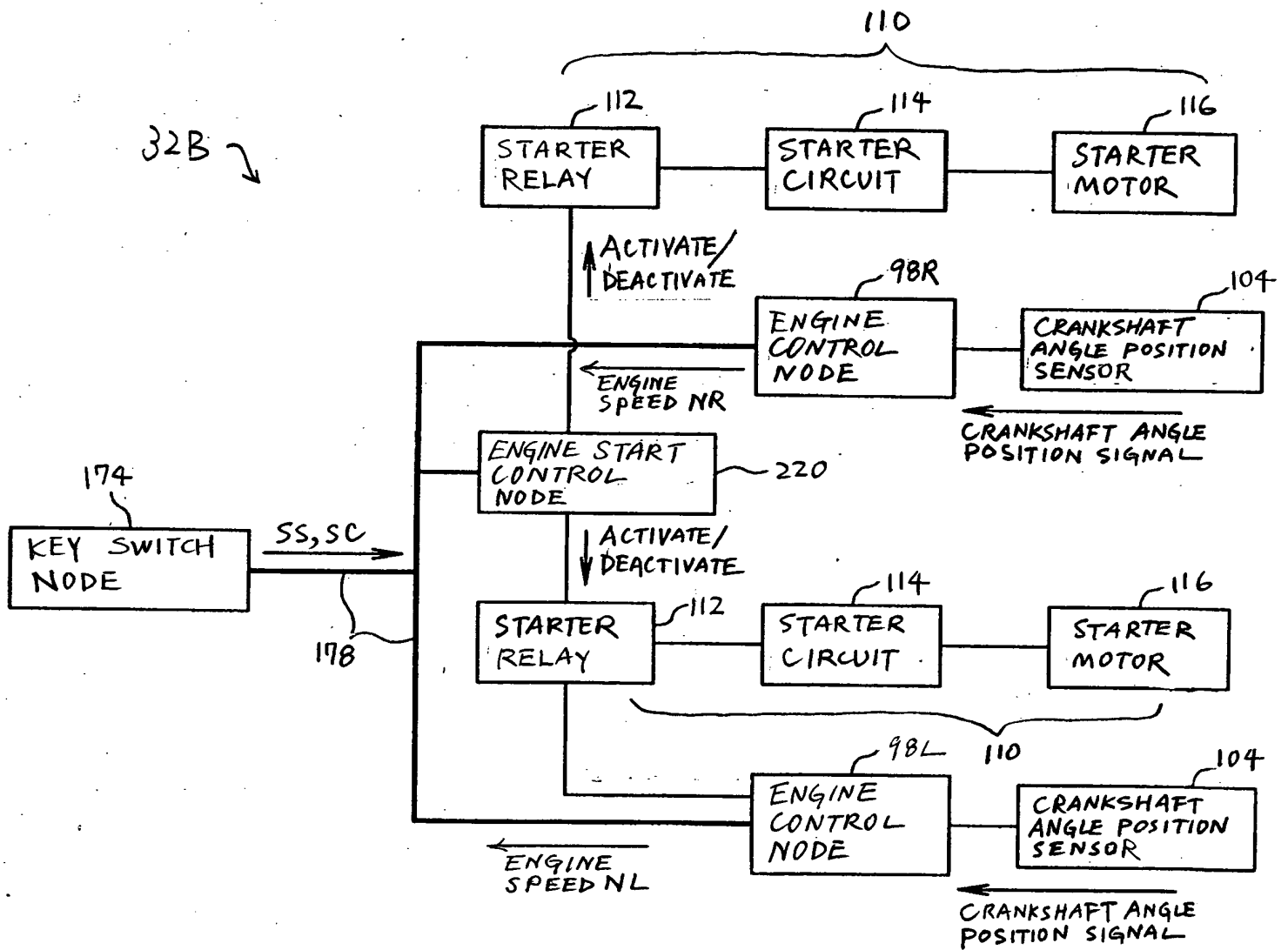


FIGURE 10